

Sequence Listing

<110> Botstein,David
Desnoyers,Luc
Ferrara,Napoleone
Fong,Sherman
Gao,Wei-Qiang
Goddard,Audrey
Gurney,Austin L.
Pan,James
Roy,Margaret Ann
Stewart,Timothy A.
Tumas,Daniel
Watanabe,Colin K.
Wood,William I.

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<211> 830

<212> PRT

<213> Homo sapiens

<400> 7

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| Met | Glu | Gln | Tyr | Lys | Leu | Gln | Ser | Asp | Arg | Leu | Arg | Glu | Gln | Gln |
| 1 | | | | 5 | | | | | 10 | | | | 15 | |
| Glu | Glu | Met | Val | Glu | Leu | Arg | Leu | Arg | Leu | Glu | Leu | Val | Arg | Pro |
| | | | 20 | | | | | | 25 | | | | 30 | |
| Gly | Trp | Gly | Gly | Leu | Arg | Leu | Leu | Asn | Gly | Leu | Pro | Pro | Gly | Ser |
| | | | 35 | | | | | | 40 | | | | 45 | |
| Phe | Val | Pro | Arg | Pro | His | Thr | Ala | Pro | Leu | Gly | Gly | Ala | His | Ala |
| | | | 50 | | | | | | 55 | | | | 60 | |
| His | Val | Leu | Gly | Met | Val | Pro | Pro | Ala | Cys | Leu | Pro | Gly | Asp | Glu |
| | | | 65 | | | | | | 70 | | | | 75 | |
| Val | Gly | Ser | Glu | Gln | Arg | Gly | Glu | Gln | Val | Thr | Asn | Gly | Arg | Glu |
| | | | 80 | | | | | | 85 | | | | 90 | |
| Ala | Gly | Ala | Glu | Leu | Leu | Thr | Glu | Val | Asn | Arg | Leu | Gly | Ser | Gly |
| | | | 95 | | | | | | 100 | | | | 105 | |

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| | | | |
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| Ser Ser Ala Ala | Ser Glu Glu Glu Glu | Glu Glu Glu Glu | Pro Pro |
| 110 | 115 | 120 | |
| Arg Arg Thr Leu | His Leu Arg Arg Asn | Arg Ile Ser Asn Cys | Ser |
| 125 | 130 | 135 | |
| Gln Arg Ala Gly | Ala Arg Pro Gly Ser | Leu Pro Glu Arg Lys | Gly |
| 140 | 145 | 150 | |
| Pro Glu Leu Cys | Leu Glu Glu Leu Asp | Ala Ala Ile Pro Gly | Ser |
| 155 | 160 | 165 | |
| Arg Ala Val Gly | Gly Ser Lys Ala Arg | Val Gln Ala Arg Gln | Val |
| 170 | 175 | 180 | |
| Pro Pro Ala Thr | Ala Ser Glu Trp Arg | Leu Ala Gln Ala Gln | Gln |
| 185 | 190 | 195 | |
| Lys Ile Arg Glu | Leu Ala Ile Asn Ile | Arg Met Lys Glu Glu | Leu |
| 200 | 205 | 210 | |
| Ile Gly Glu Leu | Val Arg Thr Gly Lys | Ala Ala Gln Ala Leu | Asn |
| 215 | 220 | 225 | |
| Arg Gln His Ser | Gln Arg Ile Arg Glu | Leu Glu Gln Glu Ala | Glu |
| 230 | 235 | 240 | |
| Gln Val Arg Ala | Glu Leu Ser Glu Gly | Gln Arg Gln Leu Arg | Glu |
| 245 | 250 | 255 | |
| Leu Glu Gly Lys | Glu Leu Gln Asp Ala | Gly Glu Arg Ser Arg | Leu |
| 260 | 265 | 270 | |
| Gln Glu Phe Arg | Arg Arg Val Ala Ala | Ala Gln Ser Gln Val | Gln |
| 275 | 280 | 285 | |
| Val Leu Lys Glu | Lys Lys Gln Ala Thr | Glu Arg Leu Val Ser | Leu |
| 290 | 295 | 300 | |
| Ser Ala Gln Ser | Glu Lys Arg Leu Gln | Glu Leu Glu Arg Asn | Val |
| 305 | 310 | 315 | |
| Gln Leu Met Arg | Gln Gln Gln Gly Gln | Leu Gln Arg Arg Leu | Arg |
| 320 | 325 | 330 | |
| Glu Glu Thr Glu | Gln Lys Arg Arg Leu | Glu Ala Glu Met Ser | Lys |
| 335 | 340 | 345 | |
| Arg Gln His Arg | Val Lys Glu Leu Glu | Leu Lys His Glu Gln | Gln |
| 350 | 355 | 360 | |
| Gln Lys Ile Leu | Lys Ile Lys Thr Glu | Glu Ile Ala Ala Phe | Gln |
| 365 | 370 | 375 | |
| Arg Lys Arg Arg | Ser Gly Ser Asn Gly | Ser Val Val Ser Leu | Glu |
| 380 | 385 | 390 | |
| Gln Gln Gln Lys | Ile Glu Glu Gln Lys | Lys Trp Leu Asp | Gln |
| | | | Glu |

-H- gung gung wang wang H H gung
 odu hup hup wup wup hup h h wup
 -H- gung gung wang wang H H gung
 odu hup hup wup wup hup h h wup
 -H- gung gung wang wang H H gung
 odu hup hup wup wup hup h h wup

| 395 | 400 | 405 |
|-------------------------------------|-------------------------|-----|
| Met Glu Lys Val Leu Gln Gln Arg Arg | Ala Leu Glu Glu Leu Gly | |
| 410 | 415 | 420 |
| Glu Glu Leu His Lys Arg Glu Ala Ile | Leu Ala Lys Lys Glu Ala | |
| 425 | 430 | 435 |
| Leu Met Gln Glu Lys Thr Gly Leu Glu | Ser Lys Arg Leu Arg Ser | |
| 440 | 445 | 450 |
| Ser Gln Ala Leu Asn Glu Asp Ile Val | Arg Val Ser Ser Arg Leu | |
| 455 | 460 | 465 |
| Glu His Leu Glu Lys Glu Leu Ser Glu | Lys Ser Gly Gln Leu Arg | |
| 470 | 475 | 480 |
| Gln Gly Ser Ala Gln Ser Gln Gln Gln | Ile Arg Gly Glu Ile Asp | |
| 485 | 490 | 495 |
| Ser Leu Arg Gln Glu Lys Asp Ser Leu | Leu Lys Gln Arg Leu Glu | |
| 500 | 505 | 510 |
| Ile Asp Gly Lys Leu Arg Gln Gly Ser | Leu Leu Ser Pro Glu Glu | |
| 515 | 520 | 525 |
| Glu Arg Thr Leu Phe Gln Leu Asp Glu | Ala Ile Glu Ala Leu Asp | |
| 530 | 535 | 540 |
| Ala Ala Ile Glu Tyr Lys Asn Glu Ala | Ile Thr Cys Arg Gln Arg | |
| 545 | 550 | 555 |
| Val Leu Arg Ala Ser Ala Ser Leu Leu | Ser Gln Cys Glu Met Asn | |
| 560 | 565 | 570 |
| Leu Met Ala Lys Leu Ser Tyr Leu Ser | Ser Ser Glu Thr Arg Ala | |
| 575 | 580 | 585 |
| Leu Leu Cys Lys Tyr Phe Asp Lys Val | Val Thr Leu Arg Glu Glu | |
| 590 | 595 | 600 |
| Gln His Gln Gln Gln Ile Ala Phe Ser | Glu Leu Glu Met Gln Leu | |
| 605 | 610 | 615 |
| Glu Glu Gln Gln Arg Leu Val Tyr Trp | Leu Glu Val Ala Leu Glu | |
| 620 | 625 | 630 |
| Arg Gln Arg Leu Glu Met Asp Arg Gln | Leu Thr Leu Gln Gln Lys | |
| 635 | 640 | 645 |
| Glu His Glu Gln Asn Met Gln Leu Leu | Leu Gln Gln Ser Arg Asp | |
| 650 | 655 | 660 |
| His Leu Gly Glu Gly Leu Ala Asp Ser | Arg Arg Gln Tyr Glu Ala | |
| 665 | 670 | 675 |
| Arg Ile Gln Ala Leu Glu Lys Glu Leu | Gly Arg Tyr Met Trp Ile | |
| 680 | 685 | 690 |

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Gln | Glu | Leu | Lys | Gln | Lys | Leu | Gly | Gly | Val | Asn | Ala | Val | Gly |
| | | | | 695 | | | | | 700 | | | | | 705 |
| His | Ser | Arg | Gly | Gly | Glu | Lys | Arg | Ser | Leu | Cys | Ser | Glu | Gly | Arg |
| | | | | 710 | | | | | 715 | | | | | 720 |
| Gln | Ala | Pro | Gly | Asn | Glu | Asp | Glu | Leu | His | Leu | Ala | Pro | Glu | Leu |
| | | | | 725 | | | | | 730 | | | | | 735 |
| Leu | Trp | Leu | Ser | Pro | Leu | Thr | Glu | Gly | Ala | Pro | Arg | Thr | Arg | Glu |
| | | | | 740 | | | | | 745 | | | | | 750 |
| Glu | Thr | Arg | Asp | Leu | Val | His | Ala | Pro | Leu | Pro | Leu | Thr | Trp | Lys |
| | | | | 755 | | | | | 760 | | | | | 765 |
| Arg | Ser | Ser | Leu | Cys | Gly | Glu | Glu | Gln | Gly | Ser | Pro | Glu | Glu | Leu |
| | | | | 770 | | | | | 775 | | | | | 780 |
| Arg | Gln | Arg | Glu | Ala | Ala | Glu | Pro | Leu | Val | Gly | Arg | Val | Leu | Pro |
| | | | | 785 | | | | | 790 | | | | | 795 |
| Val | Gly | Glu | Ala | Gly | Leu | Pro | Trp | Asn | Phe | Gly | Pro | Leu | Ser | Lys |
| | | | | 800 | | | | | 805 | | | | | 810 |
| Pro | Arg | Arg | Glu | Leu | Arg | Arg | Ala | Ser | Pro | Gly | Met | Ile | Asp | Val |
| | | | | 815 | | | | | 820 | | | | | 825 |
| Arg | Lys | Asn | Pro | Leu | | | | | | | | | | |
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 gtgtgggaac aagatctaca acccttcaga gcagtgtgt tatgatgatg 200
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 taaaaacccc aggctccact ggcagacggc agacaagggg agaagagacg 450
 aagcagctgg acatcggaga ctacagttga acttcggaga gaagcaactt 500
 gacttcagag ggatggctca atgacatagc tttggagagg agcccagctg 550

gggatggcca gacttcaggg gaagaatgcc ttcctgcttc atcccccttc 600
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 <211> 125
 <212> PRT
 <213> Homo sapiens

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 35 40 45
 Lys Ile Tyr Asn Pro Ser Glu Gln Cys Cys Tyr Asp Asp Ala Ile
 50 55 60
 Leu Ser Leu Lys Glu Thr Arg Arg Cys Gly Ser Thr Cys Thr Phe
 65 70 75
 Trp Pro Cys Phe Glu Leu Cys Cys Pro Glu Ser Phe Gly Pro Gln
 80 85 90
 Gln Lys Phe Leu Val Lys Leu Arg Val Leu Gly Met Lys Ser Gln
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 Cys His Leu Ser Pro Ile Ser Arg Ser Cys Thr Arg Asn Arg Arg
 110 115 120
 His Val Leu Tyr Pro
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<210> 11

<211> 325

<212> PRT

<213> Homo sapiens

<400> 11

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Ile Pro Leu Glu Lys Leu Ala Gln Ala Pro Glu Gln Pro Gly Gln
35 40 45

Glu Lys Arg Glu His Ala Thr Arg Asp Gly Pro Gly Arg Val Asn
50 55 60

Glu Leu Gly Arg Pro Ala Arg Asp Glu Gly Gly Ser Gly Arg Asp
65 70 75

Trp Lys Ser Lys Ser Gly Arg Gly Leu Ala Gly Arg Glu Pro Trp
80 85 90

Ser Lys Leu Lys Gln Ala Trp Val Ser Gln Gly Gly Gly Ala Lys
95 100 105

Ala Gly Asp Leu Gln Val Arg Pro Arg Gly Asp Thr Pro Gln Ala
110 115 120

Glu Ala Leu Ala Ala Ala Ala Gln Asp Ala Ile Gly Pro Glu Leu
125 130 135

Ala Pro Thr Pro Glu Pro Pro Glu Glu Tyr Val Tyr Pro Asp Tyr
140 145 150

Arg Gly Lys Gly Cys Val Asp Glu Ser Gly Phe Val Tyr Ala Ile
155 160 165

Gly Glu Lys Phe Ala Pro Gly Pro Ser Ala Cys Pro Cys Leu Cys
170 175 180

Thr Glu Glu Gly Pro Leu Cys Ala Gln Pro Glu Cys Pro Arg Leu
185 190 195

His Pro Arg Cys Ile His Val Asp Thr Ser Gln Cys Cys Pro Gln
200 205 210

Cys Lys Glu Arg Lys Asn Tyr Cys Glu Phe Arg Gly Lys Thr Tyr
215 220 225

Gln Thr Leu Glu Glu Phe Val Val Ser Pro Cys Glu Arg Cys Arg

| | | |
|---|-----|-----|
| 230 | 235 | 240 |
| Cys Glu Ala Asn Gly Glu Val Leu Cys Thr Val Ser Ala Cys Pro | | |
| 245 | 250 | 255 |
| Gln Thr Glu Cys Val Asp Pro Val Tyr Glu Pro Asp Gln Cys Cys | | |
| 260 | 265 | 270 |
| Pro Ile Cys Lys Asn Gly Pro Asn Cys Phe Ala Glu Thr Ala Val | | |
| 275 | 280 | 285 |
| Ile Pro Ala Gly Arg Glu Val Lys Thr Asp Glu Cys Thr Ile Cys | | |
| 290 | 295 | 300 |
| His Cys Thr Tyr Glu Glu Gly Thr Trp Arg Ile Glu Arg Gln Ala | | |
| 305 | 310 | 315 |
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| 320 | 325 | |

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<220>
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<210> 14
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 <212> DNA
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<400> 15

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Asn Thr Ser Cys Asp Ser Gly Leu Gly Cys Gln Asp Thr Leu Met
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Leu Ile Glu Ser Gly Pro Gln Val Ser Leu Val Leu Ser Lys Gly
65 70 75
Cys Thr Glu Ala Lys Asp Gln Glu Pro Arg Val Thr Glu His Arg
80 85 90
Met Gly Pro Gly Leu Ser Leu Ile Ser Tyr Thr Phe Val Cys Arg
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Gln Glu Asp Phe Cys Asn Asn Leu Val Asn Ser Leu Pro Leu Trp
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140 145 150
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170 175 180
Pro Gln Pro Gly Cys Asn Leu Leu Asn Gly Thr Gln Glu Ile Gly
185 190 195
Pro Val Gly Met Thr Glu Asn Cys Asn Arg Lys Asp Phe Leu Thr
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Cys His Arg Gly Thr Thr Ile Met Thr His Gly Asn Leu Ala Gln
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Glu Pro Thr Asp Trp Thr Thr Ser Asn Thr Glu Met Cys Glu Val

| | | |
|-------------------------------------|-------------------------|-----|
| 230 | 235 | 240 |
| Gly Gln Val Cys Gln Glu Thr Leu Leu | Leu Ile Asp Val Gly Leu | |
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| Thr Ser Thr Leu Val Gly Thr Lys Gly | Cys Ser Thr Val Gly Ala | |
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| Gln Asn Ser Gln Lys Thr Thr Ile His | Ser Ala Pro Pro Gly Val | |
| 275 | 280 | 285 |
| Leu Val Ala Ser Tyr Thr His Phe Cys | Ser Ser Asp Leu Cys Asn | |
| 290 | 295 | 300 |
| Ser Ala Ser Ser Ser Ser Val Leu Leu | Asn Ser Leu Pro Pro Gln | |
| 305 | 310 | 315 |
| Ala Ala Pro Val Pro Gly Asp Arg Gln | Cys Pro Thr Cys Val Gln | |
| 320 | 325 | 330 |
| Pro Leu Gly Thr Cys Ser Ser Gly Ser | Pro Arg Met Thr Cys Pro | |
| 335 | 340 | 345 |
| Arg Gly Ala Thr His Cys Tyr Asp Gly | Tyr Ile His Leu Ser Gly | |
| 350 | 355 | 360 |
| Gly Gly Leu Ser Thr Lys Met Ser Ile | Gln Gly Cys Val Ala Gln | |
| 365 | 370 | 375 |
| Pro Ser Ser Phe Leu Leu Asn His Thr | Arg Gln Ile Gly Ile Phe | |
| 380 | 385 | 390 |
| Ser Ala Arg Glu Lys Arg Asp Val Gln | Pro Pro Ala Ser Gln His | |
| 395 | 400 | 405 |
| Glu Gly Gly Gly Ala Glu Gly Leu Glu | Ser Leu Thr Trp Gly Val | |
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<211> 2387

<212> DNA

<213> Homo sapiens

<400> 17

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<211> 487

<212> PRT

<213> Homo sapiens

<400> 18

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Arg | Ala | Pro | Gly | Cys | Leu | Leu | Arg | Thr | Ser | Val | Ala | Pro |
| 1 | | | | 5 | | | | | 10 | | | | | 15 |

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Ala | Ala | Leu | Ala | Ala | Ala | Leu | Leu | Ser | Ser | Leu | Ala | Arg | Cys |
| | | | 20 | | | | | | 25 | | | | | 30 |

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Leu | Leu | Glu | Pro | Arg | Asp | Pro | Val | Ala | Ser | Ser | Leu | Ser | Pro |
| | | | 35 | | | | | | 40 | | | | | 45 |

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Tyr | Phe | Gly | Thr | Lys | Thr | Arg | Tyr | Glu | Asp | Val | Asn | Pro | Val | Leu |
| | | | 50 | | | | | | 55 | | | | | 60 |

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ser | Gly | Pro | Glu | Ala | Pro | Trp | Arg | Asp | Pro | Glu | Leu | Leu | Glu |
| | | | 65 | | | | | | 70 | | | | | 75 |

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Thr | Cys | Thr | Pro | Val | Gln | Leu | Val | Ala | Leu | Ile | Arg | His | Gly |
| | | | 80 | | | | | | 85 | | | | | 90 |

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Arg | Tyr | Pro | Thr | Val | Lys | Gln | Ile | Arg | Lys | Leu | Arg | Gln | Leu |
| | | | 95 | | | | | | 100 | | | | | 105 |

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| His | Gly | Leu | Leu | Gln | Ala | Arg | Gly | Ser | Arg | Asp | Gly | Gly | Ala | Ser |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

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 Ser Thr Gly Ser Arg Asp Leu Gly Ala Ala Leu Ala Asp Trp Pro
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 Leu Trp Tyr Ala Asp Trp Met Asp Gly Gln Leu Val Glu Lys Gly
 140 145 150
 Arg Gln Asp Met Arg Gln Leu Ala Leu Arg Leu Ala Ser Leu Phe
 155 160 165
 Pro Ala Leu Phe Ser Arg Glu Asn Tyr Gly Arg Leu Arg Leu Ile
 170 175 180
 Thr Ser Ser Lys His Arg Cys Met Asp Ser Ser Ala Ala Phe Leu
 185 190 195
 Gln Gly Leu Trp Gln His Tyr His Pro Gly Leu Pro Pro Pro Asp
 200 205 210
 Val Ala Asp Met Glu Phe Gly Pro Pro Thr Val Asn Asp Lys Leu
 215 220 225
 Met Arg Phe Phe Asp His Cys Glu Lys Phe Leu Thr Glu Val Glu
 230 235 240
 Lys Asn Ala Thr Ala Leu Tyr His Val Glu Ala Phe Lys Thr Gly
 245 250 255
 Pro Glu Met Gln Asn Ile Leu Lys Lys Val Ala Ala Thr Leu Gln
 260 265 270
 Val Pro Val Asn Asp Leu Asn Ala Asp Leu Ile Gln Val Ala Phe
 275 280 285
 Phe Thr Cys Ser Phe Asp Leu Ala Ile Lys Gly Val Lys Ser Pro
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 Trp Cys Asp Val Phe Asp Ile Asp Asp Ala Lys Val Leu Glu Tyr
 305 310 315
 Leu Asn Asp Leu Lys Gln Tyr Trp Lys Arg Gly Tyr Gly Tyr Thr
 320 325 330
 Ile Asn Ser Arg Ser Ser Cys Thr Leu Phe Gln Asp Ile Phe Gln
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 His Leu Asp Lys Ala Val Glu Gln Lys Gln Arg Ser Gln Pro Ile
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 Ser Ser Pro Val Ile Leu Gln Phe Gly His Ala Glu Thr Leu Leu
 365 370 375
 Pro Leu Leu Ser Leu Met Gly Tyr Phe Lys Asp Lys Glu Pro Leu
 380 385 390
 Thr Ala Tyr Asn Tyr Lys Lys Gln Met His Arg Lys Phe Arg Ser
 395 400 405

Gly Leu Ile Val Pro Tyr Ala Ser Asn Leu Ile Phe Val Leu Tyr
410 415 420

His Cys Glu Asn Ala Lys Thr Pro Lys Glu Gln Phe Arg Val Gln
425 430 435

Met Leu Leu Asn Glu Lys Val Leu Pro Leu Ala Tyr Ser Gln Glu
440 445 450

Thr Val Ser Phe Tyr Glu Asp Leu Lys Asn His Tyr Lys Asp Ile
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Asn Ser Thr Ser Asp Glu Leu
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| Met | Ala | Leu | Arg | Arg | Pro | Pro | Arg | Leu | Arg | Leu | Cys | Ala | Arg | Leu | 1 | 5 | 10 | 15 |
| Pro | Asp | Phe | Phe | Leu | Leu | Leu | Leu | Phe | Arg | Gly | Cys | Leu | Ile | Gly | 20 | 25 | 30 | |
| Ala | Val | Asn | Leu | Lys | Ser | Ser | Asn | Arg | Thr | Pro | Val | Val | Gln | Glu | 35 | 40 | 45 | |
| Phe | Glu | Ser | Val | Glu | Leu | Ser | Cys | Ile | Ile | Thr | Asp | Ser | Gln | Thr | 50 | 55 | 60 | |
| Ser | Asp | Pro | Arg | Ile | Glu | Trp | Lys | Lys | Ile | Gln | Asp | Glu | Gln | Thr | 65 | 70 | 75 | |
| Thr | Tyr | Val | Phe | Phe | Asp | Asn | Lys | Ile | Gln | Gly | Asp | Leu | Ala | Gly | 80 | 85 | 90 | |
| Arg | Ala | Glu | Ile | Leu | Gly | Lys | Thr | Ser | Leu | Lys | Ile | Trp | Asn | Val | 95 | 100 | 105 | |
| Thr | Arg | Arg | Asp | Ser | Ala | Leu | Tyr | Arg | Cys | Glu | Val | Val | Ala | Arg | 110 | 115 | 120 | |
| Asn | Asp | Arg | Lys | Glu | Ile | Asp | Glu | Ile | Val | Ile | Glu | Leu | Thr | Val | 125 | 130 | 135 | |
| Gln | Val | Lys | Pro | Val | Thr | Pro | Val | Cys | Arg | Val | Pro | Lys | Ala | Val | 140 | 145 | 150 | |
| Pro | Val | Gly | Lys | Met | Ala | Thr | Leu | His | Cys | Gln | Glu | Ser | Glu | Gly | 155 | 160 | 165 | |
| His | Pro | Arg | Pro | His | Tyr | Ser | Trp | Tyr | Arg | Asn | Asp | Val | Pro | Leu | 170 | 175 | 180 | |
| Pro | Thr | Asp | Ser | Arg | Ala | Asn | Pro | Arg | Phe | Arg | Asn | Ser | Ser | Phe | 185 | 190 | 195 | |
| His | Leu | Asn | Ser | Glu | Thr | Gly | Thr | Leu | Val | Phe | Thr | Ala | Val | His | 200 | 205 | 210 | |
| Lys | Asp | Asp | Ser | Gly | Gln | Tyr | Tyr | Cys | Ile | Ala | Ser | Asn | Asp | Ala | 215 | 220 | 225 | |
| Gly | Ser | Ala | Arg | Cys | Glu | Glu | Gln | Glu | Met | Glu | Val | Tyr | Asp | Leu | 230 | 235 | 240 | |
| Asn | Ile | Gly | Gly | Ile | Ile | Gly | Gly | Val | Leu | Val | Val | Leu | Ala | Val | 245 | 250 | 255 | |
| Leu | Ala | Leu | Ile | Thr | Leu | Gly | Ile | Cys | Cys | Ala | Tyr | Arg | Arg | Gly | 260 | 265 | 270 | |
| Tyr | Phe | Ile | Asn | Asn | Lys | Gln | Asp | Gly | Glu | Ser | Tyr | Lys | Asn | Pro | 275 | 280 | 285 | |
| Gly | Lys | Pro | Asp | Gly | Val | Asn | Tyr | Ile | Arg | Thr | Asp | Glu | Glu | Gly | | | | |

290

295

300

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<211> 3437

<212> DNA

<213> Homo sapiens

<400> 21

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<211> 1029

<212> PRT

<213> Homo sapiens

<400> 22

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| Met | His | Ile | Leu | Val | Val | His | Ala | Met | Val | Ile | Leu | Leu | Thr | Leu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 |
| Gly | Pro | Pro | Arg | Ala | Asp | Asp | Ser | Glu | Phe | Gln | Ala | Leu | Leu | Asp |
| | | | 20 | | | | | | 25 | | | | | 30 |
| Ile | Trp | Phe | Pro | Glu | Glu | Lys | Pro | Leu | Pro | Thr | Ala | Phe | Leu | Val |
| | | | 35 | | | | | | 40 | | | | | 45 |
| Asp | Thr | Ser | Glu | Glu | Ala | Leu | Leu | Leu | Pro | Asp | Trp | Leu | Lys | Leu |
| | | | 50 | | | | | | 55 | | | | | 60 |
| Arg | Met | Ile | Arg | Ser | Glu | Val | Leu | Arg | Leu | Val | Asp | Ala | Ala | Leu |
| | | | 65 | | | | | | 70 | | | | | 75 |
| Gln | Asp | Leu | Glu | Pro | Gln | Gln | Leu | Leu | Leu | Phe | Val | Gln | Ser | Phe |
| | | | 80 | | | | | | 85 | | | | | 90 |
| Gly | Ile | Pro | Val | Ser | Ser | Met | Ser | Lys | Leu | Leu | Gln | Phe | Leu | Asp |
| | | | 95 | | | | | | 100 | | | | | 105 |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Ala | Val | Ala | His | Asp | Pro | Gln | Thr | Leu | Glu | Gln | Asn | Ile | Met | 110 | 115 | 120 |
| Asp | Lys | Asn | Tyr | Met | Ala | His | Leu | Val | Glu | Val | Gln | His | Glu | Arg | 125 | 130 | 135 |
| Gly | Ala | Ser | Gly | Gly | Gln | Thr | Phe | His | Ser | Leu | Leu | Thr | Ala | Ser | 140 | 145 | 150 |
| Leu | Pro | Pro | Arg | Arg | Asp | Ser | Thr | Glu | Ala | Pro | Lys | Pro | Lys | Ser | 155 | 160 | 165 |
| Ser | Pro | Glu | Gln | Pro | Ile | Gly | Gln | Gly | Arg | Ile | Arg | Val | Gly | Thr | 170 | 175 | 180 |
| Gln | Leu | Arg | Val | Leu | Gly | Pro | Glu | Asp | Asp | Leu | Ala | Gly | Met | Phe | 185 | 190 | 195 |
| Leu | Gln | Ile | Phe | Pro | Leu | Ser | Pro | Asp | Pro | Arg | Trp | Gln | Ser | Ser | 200 | 205 | 210 |
| Ser | Pro | Arg | Pro | Val | Ala | Leu | Ala | Leu | Gln | Gln | Ala | Leu | Gly | Gln | 215 | 220 | 225 |
| Glu | Leu | Ala | Arg | Val | Val | Gln | Gly | Ser | Pro | Glu | Val | Pro | Gly | Ile | 230 | 235 | 240 |
| Thr | Val | Arg | Val | Leu | Gln | Ala | Leu | Ala | Thr | Leu | Leu | Ser | Ser | Pro | 245 | 250 | 255 |
| His | Gly | Gly | Ala | Leu | Val | Met | Ser | Met | His | Arg | Ser | His | Phe | Leu | 260 | 265 | 270 |
| Ala | Cys | Pro | Leu | Leu | Arg | Gln | Leu | Cys | Gln | Tyr | Gln | Arg | Cys | Val | 275 | 280 | 285 |
| Pro | Gln | Asp | Thr | Gly | Phe | Ser | Ser | Leu | Phe | Leu | Lys | Val | Leu | Leu | 290 | 295 | 300 |
| Gln | Met | Leu | Gln | Trp | Leu | Asp | Ser | Pro | Gly | Val | Glu | Gly | Gly | Pro | 305 | 310 | 315 |
| Leu | Arg | Ala | Gln | Leu | Arg | Met | Leu | Ala | Ser | Gln | Ala | Ser | Ala | Gly | 320 | 325 | 330 |
| Arg | Arg | Leu | Ser | Asp | Val | Arg | Gly | Gly | Leu | Leu | Arg | Leu | Ala | Glu | 335 | 340 | 345 |
| Ala | Leu | Ala | Phe | Arg | Gln | Asp | Leu | Glu | Val | Val | Ser | Ser | Thr | Val | 350 | 355 | 360 |
| Arg | Ala | Val | Ile | Ala | Thr | Leu | Arg | Ser | Gly | Glu | Gln | Cys | Ser | Val | 365 | 370 | 375 |
| Glu | Pro | Asp | Leu | Ile | Ser | Lys | Val | Leu | Gln | Gly | Leu | Ile | Glu | Val | 380 | 385 | 390 |
| Arg | Ser | Pro | His | Leu | Glu | Glu | Leu | Leu | Thr | Ala | Phe | Phe | Ser | Ala | | | |

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|--|-----|-----|-----|
| Ser Arg Ala Leu Glu Asn Arg Gly Ala Asp Ala Ser Met Ala Cys | 695 | 700 | 705 |
| Arg Lys Leu ^a Ala Val Ala His Pro Leu Leu Leu Arg His Leu | 710 | 715 | 720 |
| Pro Met Ile Ala Ala Leu Leu His Gly Arg Thr His Leu Asn Phe | 725 | 730 | 735 |
| Gln Glu Phe Arg Gln Gln Asn His Leu Ser Cys Phe Leu His Val | 740 | 745 | 750 |
| Leu Gly Leu Leu Glu Leu Leu Gln Pro His Val Phe Arg Ser Glu | 755 | 760 | 765 |
| His Gln Gly Ala Leu Trp Asp Cys Leu Leu Ser Phe Ile Arg Leu | 770 | 775 | 780 |
| Leu Leu Asn Tyr Arg Lys Ser Ser Arg His Leu Ala Ala Phe Ile | 785 | 790 | 795 |
| Asn Lys Phe Val Gln Phe Ile His Lys Tyr Ile Thr Tyr Asn Ala | 800 | 805 | 810 |
| Pro Ala Ala Ile Ser Phe Leu Gln Lys His Ala Asp Pro Leu His | 815 | 820 | 825 |
| Asp Leu Ser Phe Asp Asn Ser Asp Leu Val Met Leu Lys Ser Leu | 830 | 835 | 840 |
| Leu Ala Gly Leu Ser Leu Pro Ser Arg Asp Asp Arg Thr Asp Arg | 845 | 850 | 855 |
| Gly Leu Asp Glu Glu Gly Glu Glu Glu Ser Ser Ala Gly Ser Leu | 860 | 865 | 870 |
| Pro Leu Val Ser Val Ser Leu Phe Thr Pro Leu Thr Ala Ala Glu | 875 | 880 | 885 |
| Met Ala Pro Tyr Met Lys Arg Leu Ser Arg Gly Gln Thr Val Glu | 890 | 895 | 900 |
| Asp Leu Leu Glu Val Leu Ser Asp Ile Asp Glu Met Ser Arg Arg | 905 | 910 | 915 |
| Arg Pro Glu Ile Leu Ser Phe Phe Ser Thr Asn Leu Gln Arg Leu | 920 | 925 | 930 |
| Met Ser Ser Ala Glu Glu Cys Cys Arg Asn Leu Ala Phe Ser Leu | 935 | 940 | 945 |
| Ala Leu Arg Ser Met Gln Asn Ser Pro Ser Ile Ala Ala Ala Phe | 950 | 955 | 960 |
| Leu Pro Thr Phe Met Tyr Cys Leu Gly Ser Gln Asp Phe Glu Val | 965 | 970 | 975 |
| Val Gln Thr Ala Leu Arg Asn Leu Pro Glu Tyr Ala Leu Leu Cys | | | |

980

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990

Gln Glu His Ala Ala Val Leu Leu His Arg Ala Phe Leu Val Gly
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<212> DNA

<213> Homo sapiens

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 <213> Homo sapiens

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 20 25 30

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|---|-----|-----|-----|
| Gln Lys Gly Asp Val Val Asp Val Tyr Gln Arg Glu Phe Leu Ala | 35 | 40 | 45 |
| Leu Arg Asp Arg Leu His Ala Ala Glu Gln Glu Ser Leu Lys Arg | 50 | 55 | 60 |
| Ser Lys Glu Leu Asn Leu Val Leu Asp Glu Ile Lys Arg Ala Val | 65 | 70 | 75 |
| Ser Glu Arg Gln Ala Leu Arg Asp Gly Asp Gly Asn Arg Thr Trp | 80 | 85 | 90 |
| Gly Arg Leu Thr Glu Asp Pro Arg Leu Lys Pro Trp Asn Gly Ser | 95 | 100 | 105 |
| His Arg His Val Leu His Leu Pro Thr Val Phe His His Leu Pro | 110 | 115 | 120 |
| His Leu Leu Ala Lys Glu Ser Ser Leu Gln Pro Ala Val Arg Val | 125 | 130 | 135 |
| Gly Gln Gly Arg Thr Gly Val Ser Val Val Met Gly Ile Pro Ser | 140 | 145 | 150 |
| Val Arg Arg Glu Val His Ser Tyr Leu Thr Asp Thr Leu His Ser | 155 | 160 | 165 |
| Leu Ile Ser Glu Leu Ser Pro Gln Glu Lys Glu Asp Ser Val Ile | 170 | 175 | 180 |
| Val Val Leu Ile Ala Glu Thr Asp Ser Gln Tyr Thr Ser Ala Val | 185 | 190 | 195 |
| Thr Glu Asn Ile Lys Ala Leu Phe Pro Thr Glu Ile His Ser Gly | 200 | 205 | 210 |
| Leu Leu Glu Val Ile Ser Pro Ser Pro His Phe Tyr Pro Asp Phe | 215 | 220 | 225 |
| Ser Arg Leu Arg Glu Ser Phe Gly Asp Pro Lys Glu Arg Val Arg | 230 | 235 | 240 |
| Trp Arg Thr Lys Gln Asn Leu Asp Tyr Cys Phe Leu Met Met Tyr | 245 | 250 | 255 |
| Ala Gln Ser Lys Gly Ile Tyr Tyr Val Gln Leu Glu Asp Asp Ile | 260 | 265 | 270 |
| Val Ala Lys Pro Asn Tyr Leu Ser Thr Met Lys Asn Phe Ala Leu | 275 | 280 | 285 |
| Gln Gln Pro Ser Glu Asp Trp Met Ile Leu Glu Phe Ser Gln Leu | 290 | 295 | 300 |
| Gly Phe Ile Gly Lys Met Phe Lys Ser Leu Asp Leu Ser Leu Ile | 305 | 310 | 315 |
| Val Glu Phe Ile Leu Met Phe Tyr Arg Asp Lys Pro Ile Asp Trp | | | |

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|-------------------------------------|-------------------------|-----|
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| Leu Leu Asp His Ile Leu Trp Val Lys | Val Cys Asn Pro Glu Lys | |
| 335 | 340 | 345 |
| Asp Ala Lys His Cys Asp Arg Gln Lys | Ala Asn Leu Arg Ile Arg | |
| 350 | 355 | 360 |
| Phe Lys Pro Ser Leu Phe Gln His Val | Gly Thr His Ser Ser Leu | |
| 365 | 370 | 375 |
| Ala Gly Lys Ile Gln Lys Leu Lys Asp | Lys Asp Phe Gly Lys Gln | |
| 380 | 385 | 390 |
| Ala Leu Arg Lys Glu His Val Asn Pro | Pro Ala Glu Val Ser Thr | |
| 395 | 400 | 405 |
| Ser Leu Lys Thr Tyr Gln His Phe Thr | Leu Glu Lys Ala Tyr Leu | |
| 410 | 415 | 420 |
| Arg Glu Asp Phe Phe Trp Ala Phe Thr | Pro Ala Ala Gly Asp Phe | |
| 425 | 430 | 435 |
| Ile Arg Phe Arg Phe Phe Gln Pro Leu | Arg Leu Glu Arg Phe Phe | |
| 440 | 445 | 450 |
| Phe Arg Ser Gly Asn Ile Glu His Pro | Glu Asp Lys Leu Phe Asn | |
| 455 | 460 | 465 |
| Thr Ser Val Glu Val Leu Pro Phe Asp | Asn Pro Gln Ser Asp Lys | |
| 470 | 475 | 480 |
| Glu Ala Leu Gln Glu Gly Arg Thr Ala | Thr Leu Arg Tyr Pro Arg | |
| 485 | 490 | 495 |
| Ser Pro Asp Gly Tyr Leu Gln Ile Gly | Ser Phe Tyr Lys Gly Val | |
| 500 | 505 | 510 |
| Ala Glu Gly Glu Val Asp Pro Ala Phe | Gly Pro Leu Glu Ala Leu | |
| 515 | 520 | 525 |
| Arg Leu Ser Ile Gln Thr Asp Ser Pro | Val Trp Val Ile Leu Ser | |
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<210> 26
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